85. Specific categorical Modelling System, first stage

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The specific categorical Modelling System is the first step in the third stage in the first phase for the construction of Specific Artificial Intelligences forArtificial Research by Application, whose first stage or comprehension stage consists of the database of categories (a complete list or taxonomy of specific conceptual categories regarding to some specific science, discipline, activity), the second stage or explanation stage consists of the attributional process of categories to real objects, and the third stage or decision stage will consist of all those process destined to make decisions according to the attribution of categories to real objects.

This first stage of any Specific Artificial Intelligence, by Application or by Deduction, is in essence an application stage or comprehension stage, and the first stage in the Specific Artificial Intelligence by Application consists of a database of categories, as a list or taxonomy of concepts regarding to an specific science, discipline, or activity, like if it were the encyclopedia of that specific science, discipline or activity, for instance, the first stage or application stage in botany should include all categories of vegetables, the first stage or application stage in mineralogy should include all categories of minerals. The first stage is called the application stage or comprehension stage because the database works as if it were the application itself, and the main objective of the application is to serve as a tool to comprehend the world.

The second stage of any Specific Artificial Intelligence, by Application or by Deduction, is the replication stage or explanation stage, and the second stage in the Specific Artificial Intelligence by Application consists of the replication in artificial psychology of all those human psychological skills responsible for the attribution of categories to real objects. For instance, given any plant, the attribution of the right category within the database of categories in the first stage to any plant in the real world, matching categories of plants and real plants to know what type of plant, according to the specific database of categories on botany, is every plant in the real world. This process of matching categories of botany and real plants is an explanation process to explain what type of plant every plant is in the reality.

The third stage of any Specific Artificial Intelligence, by Application or by Deduction, is the auto-replication stage or decision stage, and the possible auto-replications could be subdivided into objective auto –auto-replications and subjective auto-replications. In turn, objective auto-replications could be sub-divided between real objective auto-replications and knowledge objective auto-replications. And subjective auto-replications could be subdivided between artificial psychological subjective auto-replications and robotic subjective auto-replications. In any case, the concept of auto-replication means self-improvement or self-enhancement, of the reality (real), the knowledge (factual or categorical), the artificial psychology (software), the robotic system (hardware).

For real objective auto-replication is understood the capacity of an Specific or Global Artificial Intelligence to improve the reality, the real world, by itself, without human assistance, so an Artificial Intelligence, Specific or Global, could be able to improve a particular, specific, or global, reality, the improvement of the conditions of a particular thing or being, an specific field of a science, a discipline, or activity, or the real improvement of the whole world by artificial means only.

For instance, given an Specific Artificial Intelligence by Application specialised in farming, given any land in any place (from the Earth or any other planet) to decide what to culture, having an exhaustive database of agriculture this intelligence as first stage, should be able to match what kind of plant is better for that land according to the qualities of that land and the weather in that area, matching this land and the weather with the most suitable seeds to grow up in that land with that weather.

In this last case, the specific database of categories of that Specific Artificial Intelligence by Application specialised in farming, having included a database of categories of plants, for every plant the category should have included a very exhaustive description in mathematical terms of every type of plant including a very objective description in quantitative terms of what atmospheric and geological conditions are the most suitable for each plant in the specific database of categories of plants in farming.

For instance, according to the chemical composition of the farmland and the weather, what seeds are more suitable to grow under such chemical and atmospheric conditions? This attributional process matching land and seeds is an attribution of the second stage of replication or explanation, in that Specific Artificial Intelligence by Application responsible for the farming in that area.

Once the Specific Artificial Intelligence by Application in the second stage has matched the land and the seeds, the third stage consists of all the range of decisions and instructions to makeit possible to seed that land according to the attribution made on the second stage.

The third stage as an auto-replication or decision stage, as real objective auto-replication has as purpose to improve the reality, in this case, in order to improve the cultivation on the farm, once the second stage has attributed what kind of seed is most suitable for a land, the third stage must carry out all the range of decisions and instructions to make it possible.

For this purpose the third stage as real objective auto-replication to improve the farming system on the farm, will carry out the process through four steps: the first step the specific categorical Modelling System, the second step the specific categorical Decisional System, the third step the specific categorical Application System, the four step the specific categorical Learning System.

The inner organization of every step, is though the organization of every step according to the three stages, first stage of application or comprehension as a database, second stage of replication or explanation as all artificial psychological skills replicated from the human psychology, and third stage of auto-replication or decision stage to carry out the decisions according to the explanation of the reality given in the second stage.

In the case of the specific categorical Modelling System, as first stage a conceptual scheme, as second stage the conceptual sets, models, maps, what means that the first and second stages are going to integrate the deep artificial comprehension system, and as third stage the decision according to the deep artificial comprehension system, having as a psychological hypothesis that in order to explain something firstly is necessary to comprehend something, is you do not comprehend something, you cannot explain it, and once you can explain it, you can decide on that matter.

In general the sequence in human knowledge is: comprehension, explanation, decision; what in artificial psychology is translatable to: application, replication, auto-replication as self-improvement of the real world, the artificial knowledge (categorical or deductive),

the hard/soft-ware, self-improvement made by the artificial psychology itself without human assistance.

While the first and second stage of any intelligence, global or specific, by Application and by Deduction, consists only of one only stage, what means that the first stage consists only of a database as first stage, and the second stage consists only of the attributional process as replication a human psychological skill: by Application the attribution of real objects to categories within the database, by Deduction the attribution of sets of data from the specific, global, or particular matrix, to a pure reason (equation).

In both cases, the first stage and the second stage, as comprehension and explanation stages, by Application or by Deduction, consist only of single stages: the first stage is the database as comprehension stage, second stage is the attributional process as a replica of human psychology.

Instead, the way in which this sequence of comprehension-explanation-decision, as application-replication-autoreplication, will be carried out in the third stage of any intelligence, global or specific, by Application or by Deduction, is through the sub-division of the whole third stage in three inner stages or sub-stages. Having an additional sub-stage more as an evaluation stage, the Learning System is in essence an evaluation stage to improve the whole intelligence.

While the first and second stages of any intelligence are single stages, as comprehension-database, explanation-attribution, the third stage is sub-divided in three inner sub-stages plus the evaluation stage of the whole intelligence.

For that reason the third stage in any intelligence, global or specific, by Application or by Deduction, is sub-divided in: first sub-stage or first step as Modelling System (the models), second sub-stage or second step as Decisional System (the projects), third sub-stage or third step as Application System (the implementation).

In fact, in the third stage, by Application or By Deduction, categorical or deductive, specific, particular, or global, in the end, the sequence of the third stage is: models, projects, implementation. Models as comprehension or application, projects as explanation or replication, implementation as auto-replication or decision. But

regardless of the name, Modelling, Decisional, Application systems, or model, project, implementation, in fact, the three stages of the human psychology are still there, but now translated into artificial psychology.

Having as fourth addition sub-stage, the evaluation as Learning System, at some point, when you evaluate you are assessing what you need to learn, not discarding at any time other possible sources of learning without previous evaluation as for instance learning by error and trial, another possible way of learning to replicate in artificial psychology to be implemented within the specific and global intelligences, in fact a learning that could be included in the Artificial General Intelligence.

Having in mind that the organization of an Specific Artificial Intelligence for Artificial Research by Application consists of first stage as database of categories of an specific science, discipline, activity, the second stage consists of the attribution of real objects to a category within that database of categories, the third stage consists of all the range of decisions and instructions to be applied according to the attribution of that real object to that category.

If an Specific Artificial Intelligence by Application specialised in farming, has a whole catalogue of different species of seeds and plants for farming within the database of categories, and as second stage has to attribute what plant or seed is better for every farmland, the third stage should consist of the plantation of every plant and seed attributed to every farmland in the second stage.

The way to carry out the third stage is through the three steps as three sub-stages within the third stage to model, project, and implement all the decisions regarding the plantation, plus another sub-stage for the whole evaluation of the process. In total, these three sub-stages plus the evaluation one are the four steps in the third stage: Modelling System (models), Decisional System (projects), Application System (implementation), and Learning System (evaluation).

Because the Modelling, Decisional, Application, Learning Systems in by Application work in a different way respect to the Modelling, Decisional, Application, Learning Systems in by deduction, to distinguish the four steps in by Application respect to by Deduction, the surname of every step by Application will be "categorical", while the surname of every step by Deduction "deductive", for that reason it is necessary to distinguish

between: specific categorical Modelling System (by Application), specific deductive Modelling System (by Deduction), specific categorical Decisional System (by Application), specific deductive Decisional System (by Deduction), specific categorical Application System (by Application), specific deductive Application System (by Deduction), specific categorical Learning System (by Application), specific deductive Learning System (by Deduction).

Understanding that the specific intelligences, by Application or by Deduction, correspond to the first phase, in the following phases, second of collaboration, third of standardization, fourth of unification, fifth of particular programs or particular applications, is necessary to highlight the distinction between categorical or deductive, distinction that disappears in the third step in the sixth phase when both models of intelligence, by Application and by Deduction are integrated finally in the integrated Application System, according to my proposal, where the plan as product to synthesised the categorical/deductive model/Project in only "The plan" wil be postpone to the sevent phase, the reason itself.

Having in mind that the third stage in by Application or by Deduction is not a single stage, and can be sub-divided in sub-stages: Modelling System, Decisional System, Application System, Learning System; in turn, every sub-stage could be subdivided into three stages, so every system is organised in three stages.

In the specific case of the specific categorical Modelling System, the three stages are the first stage as conceptual scheme, the second stage as: conceptual sets, models, maps; the third stage as that one to attribute decisions to real objects according to the category attributed in the second stage by Application.

In a farm, the Specific Artificial Intelligence by Application for farming, in the first stage has a very complete database of categories about farming, the second stage the possibility to attribute categories to real objects, for instance, the attribution of what kind of seed is more suitable for every farmland, and the third stage should be the plantation process.

In the third stage for the plantation, firstly is necessary to have accurate models, to make accurate projects, to plant the seeds, assessing in the end the accuracy of the whole process.

In this process, the first part is to make models, whose responsible is, in this case, the specific categorical Modelling System.

The way in which the specific categorical Modelling System works is, once the farmland has been labelled, attributed, to the right plant or seed, as first stage of the Modelling System as deep artificial comprehension system, firstly includes that farmland within the conceptual scheme, being the conceptual scheme the synthesis of the database of categories organised like a conceptual scheme where all the categories are linked each other by vectors according to logical relations based on conceptual sets, and within every category are included every real object attributed to that category in the previous second stage by Application. Secondly, once the real object has been file in the right category/place within the conceptual scheme, the first categorical check will ensure that there is no contradiction between the place/category where the real object has been included in the scheme and any other aspect of this place/category within the conceptual scheme.

The responsible to file the real object in the right category/place in the conceptual scheme is the second stage by Application as soon has attributed the right category, within the database of categories to that real object, once the second stage by Application has attributed the right category, according to the database of categories as first stage by Application, to that real object, then the second stage by Application files that real object in the right category/place within the conceptual scheme as first stage for the categorical Modelling System, filing the real object in the right category/place within the conceptual scheme according to the category attributed to that real object in the second stage by Application.

The different between the category/place (or place/category, the order does not change the meaning of the sense) in the conceptual scheme as first stage for the categorical Modelling System respect the category within the database of categories within the first stage by Application, is the fact that the first stage by Application as database of categories is only a list of categories or taxonomy of categories, where every category is described in quantitative terms, in order that the second stage by Application once has received the measures from a real object the only thing to do is to compare the measurements from a real object with the list or taxonomy of categories, in quantitative terms, to match what quantitative description of what category has more percentage of similarities with the measurements from the real object, making the attribution between

real object and category as soon the level of similarity between the measurements of a real object, and the quantitative description of a real object, the level of similarity is equal to or greater than a critical reason.

If, in the second stage by Application, the level of similarity between the measurements of a real object, and the quantitative description of a category, is equal to or greater than a critical reason, it is considered that this category corresponds to that real object by Application.

If, in the second stage by Application, there are two or more categories whose similarity with respect to a real object is equal to or greater than a critical reason, then the category to be chosen to make the attribution by Application is that one with the greatest level of similarity.

If, in the second stage by Application, there is no category whose level of similarity with the real object is equal to or greater than a critical reason, there are two options: 1) first option and the most rational the consideration of that real object as a new category, taking the sample of measurements as a quantitative description of this new category, 2) second option and the most utilitarian accepting a greater margin of error than the margin of error normally accepted for this kind of statistical decisions, the acceptation of that category with the less margin of error respect to that real object, although not enough to reach the critical reason, so that margin of error is greater than the margin of error normally accepted according to the critical reason set up for this decision on regular basis, understanding this solution increasing the margin of error only as an exception for this situations in which there is no category within the rational margin of error according to the critical reason.

As a result of the first option, the consideration of this real object not matching within the normal margin of error, critical reason, respect to any category within the database of categories, as if this real object were a new category, then this new real object as new category should be included as a new category within the database of categories as first stage by Application, and should be included in the conceptual scheme as first stage in the categorical Modelling System placing this new category in the conceptual scheme according to those conceptual logical sets in which this new real object had got any resemblance or similarity when matching this new real object in the second stage.

If in space exploration, a spaceship landing in another moon or planet, collects a geological sample with some minerals which do not match respect to any other category in the taxonomy of minerals already known, so this new real object is treated as if it was a new mineral, and the sample of measurements of this new mineral is treated as the quantitative description of this new mineral as new category to be included in the database of categories as first stage by Application, and placed in the right place/category in the conceptual scheme as first stage of the categorical Modelling System, the way to place this new category in the conceptual scheme according to the logical conceptual sets in which this new mineral could be placed, is analysing when the second stage by Application studied the similarities between this new mineral and the categories in the database, what level of similarity (although not enough high as to match with any category) this new mineral had with other categories, in order to analyse what kind of logical relations, as logical sets, to be treated as vectors, this new mineral got respect to other categories, in order to place the new category in the conceptual scheme according to the potential logical relations, conceptual sets, vectors, that this new mineral has respect to other ones within the categories already placed in the conceptual scheme.

What I have described in the paragraph above it should be the most rational option, the first option, when a real object does not match in the second stage by Application with any category in the second stage by Application, the consideration of this real object as a new category including its sample of measurements as the quantitative description of the new category in which this new object could be catalogued, placing this new category in the conceptual scheme as first stage of the Modelling System according to the logical relations, conceptual sets, that this new category could have respect other categories according to its level of similarity analysed in the second stage by Application, although not reaching the matching level, but level of similarity which not reaching the matching level can give information about what qualities of this new category have similarities with other categories, although not reaching the matching level, but enough as to understand this similarities as part of the logical network or conceptual network to place this new category within the conceptual scheme.

For instance if a new mineral found in another planet has a chemical composition not identical to other minerals already included in the taxonomy, but the chemical composition has some similarities, although not reaching the matching level, respect to other categories, this similarities although not reaching the matching level are going to be considered as the framework where to place the new category in the taxonomy as first stage by Application and in the conceptual scheme as first stage in the categorical Modelling System.

If a new mineral is found with high percentage of some chemical, and there other minerals with high percentage of that chemical, even being a new mineral, the place to file the new mineral in the conceptual scheme will be that place where are placed all the minerals which have in common a high percentage of that chemical.

This first option, the creation of a new category based on the measurements of a new real object when not matching with the existing categories, could be the most rational, especially when it is applied to situations where the most important aim is to get knowledge about the real world.

But when the purpose of an specific intelligence by Application is not just knowledge, but how to apply the knowledge that it already has, gathered in the database of categories as first stage by Application and the conceptual scheme as first stage of the categorical Modelling System, the most useful solution is the consideration as possible categories to be matched with that real object, although not reaching the matching level, those categories with the higher percentage of similarity, therefore the less margin of error, respect to that new real object, in order to work with that real object as if it had matched with that category, knowing before hand that it had not matched fully, being only the category with the higher percentage of similarity so the less margin of error but not reaching the matching level. While this solution may not fully align with strict rational attribution criteria, it offers a more practical alternative under real-world constraints, which is the second option or utilitarian option.

If an Specific Artificial Intelligence for Artificial Research by Application for farming, has to seed a farmland and has to decide what kind of seeds are much better according to the chemical conditions of the land and the weather in that area, and according to that information from the land there is no any category of seeds in the database of categories as first stage by Application able to reach the matching level in the second stage by Application as to be considered the most suitable seed for this farmland, in this case the second option or utilitarian option is the consideration of that seed which, not reaching the matching level, has the higher percentage of similarity, so the less margin of error, knowing before hand that this seed does not match fully with this land in order to make later on the project, the specific categorical Decisional System, as many adjustments on the project as to save all the difficulties that it could have to plant seeds with some margin of error on that land, analysing what qualities of the ground or the weather did not match with this seed as to make adjustments over this qualities, and having in mind the

adjustments to make the project, to be implemented later on the categorical Application System.

In this second option or utilitarian option, although not reaching the matching level, that category whose percentage of similarity with the real object is chosen as to be attributed to that real object, and according to this utilitarian attribution (not full attribution in this case), according to the utilitarian category assigned to that real object, the real object is filed in the place where this category is located in the conceptual scheme, making clear that is a utilitarian, not full, attribution.

The importance to distinguish between: full attribution (normal attribution when reaching the matching point not needing new categories nor utilitarian attribution), new category (first option when not having full attribution), utilitarian attribution (second option when not having full attribution); is because as soon the second stage by Application has assigned a category (full, first, utilitarian) to a real object, according to the category the object is placed in the conceptual scheme where the category is placed in the conceptual scheme, having as network the vectors that this category on the conceptual scheme could have respect to other categories according to logical relations, conceptual sets.

As soon a real object has been assigned (fully, new, utilitarian) to a category, the logical relations of this category, so the conceptual sets where this category is included, are the logical relations of this real object respect to any other objects, what means that the conceptual relations of this object respect to any other object are the conceptual relations of this category in relation to any other category, the framework of vectors or network of vectors where the category is inserted is automatically the framework or network where this real object will work on the model and the project to implement instructions, to be later evaluated.

Once the second stage by Application has made the (full, new, utilitarian) attribution, assigning a (full, new, utilitarian) category to a real object, according to the category, the second stage by Application files the real object in the conceptual scheme as first stage of the categorical Modelling System, placing the real object in that (full, new, utilitarian) category in which the real object has been assigned in the second stage by Application.

As soon the second stage by Application has placed the real object in the right (full, new, utilitarian) category on the conceptual scheme as first stage of the categorical Modelling System, is carried out the first categorical check, ensuring that, the (full, new, utilitarian) attribution made in the second stage by Application is right, checking that according to the results in the analysis of percentages done in the attributional process, the set of quantitative qualities of this real object are in harmony per average with the quantitative description of the rest of real objects filed on this category, admitting only more margin of error in utilitarian attributions, but not greater than the margin of error, although not reaching the matching level, in which the second stage by Application admitted this category for this real object as an utilitarian attribution.

If once a real object is filed in the conceptual scheme, the first categorical check does not find any contradiction, per average and within the critical reason excepting the utilitarian attributions but not higher the margin error accepted by the second stage by Application, between the new real object added to that place/category in the conceptual scheme and the rest of real objects placed in that category in the conceptual scheme, then not having found contradictions the solution of the first categorical check is that there is no contradiction in that fully, new, utilitarian attribution, so the work on the real object can move on the second stage of the categorical Modelling System, which will consist of the analysis of the logical/conceptual sets where this real object is placed, having option to remove some, especially in utilitarian attributions, as to make the model of that real object to locate on the conceptual map, and according to the model on the conceptual map the third stage of the categorical Modelling System will distribute the range of decisions to carry out the final purpose, if the final purpose of an Specific Artificial Intelligence for Artificial Research by Application for farming, is to plant and take care of the plantation, then, according to the model of plantation and the location on the map, the distribution of all the decisions necessary to plant and take care of the plantation on that farmland where the second stage by Application attributed that category of seeds.

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